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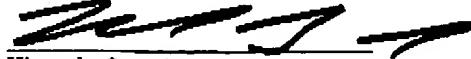
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:

Applicants(s): Narayanan Ganapathy   Examiner: Brandon S. Hoffman

Serial No: 09/772,231   Art Unit: 2136

Filing Date: January 29, 2001

Title: ISOLATION OF COMMUNICATION CONTEXTS TO FACILITATE
         COMMUNICATION OF DATA

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Dear Sir:

Applicant submits this brief in connection with an appeal of the above-identified patent application. A credit card payment form is filed concurrently herewith in connection with all fees due regarding this appeal brief. In the event any additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [MSFTP186US].

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I.   **Real Party in Interest (37 C.F.R. §41.37(c)(1)(i))**

The real party in interest in the present appeal is Microsoft Corporation, the assignee of the present application.

II.   **Related Appeals and Interferences (37 C.F.R. §41.37(c)(1)(ii))**

Appellant, appellant's legal representative, and/or the assignee of the present application are not aware of any appeals or interferences which may be related to, will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III.   **Status of Claims (37 C.F.R. §41.37(c)(1)(iii))**

Claims 1-35 stand rejected by the Examiner. The rejection of claims 1-35 is being appealed.

IV.   **Status of Amendments (37 C.F.R. §41.37(c)(1)(iv))**

No claim amendments have been entered after the Final Office Action.

V.   **Summary of Claimed Subject Matter (37 C.F.R. §41.37(c)(1)(v))**

Independent Claim 1:

Independent claim 1 relates to a system to facilitate substantially secure communication of data from a user-level process. The system includes at least a first queue associated with the process. (*See e.g.*, pg. 5, lns. 28-30). The process is operative to directly communicate a message relative to the first queue. (*See e.g.*, pg. 5, ln. 30 to pg. 6, ln. 3). The system also includes a first communication context operative to communicate the message between the first queue and a second communication context. (*See e.g.*, pg. 6, lns. 7-10). The communication between the first queue and the first communications context is controlled based on if an appropriate association exists between the first queue and the first communications context. (*See e.g.*, pg. 7, lns. 1-4). The association between the first queue and the first communications context is provided through a privileged operation not adjustable by the first process. (*See e.g.*, pg. 7, lns. 4-5).

2

Independent Claim 14:

Independent claim 14 relates to a system that facilitates communication of data. The system includes a virtual hardware component at a first node operable to communicate a message received directly from an associated process. (*See e.g.*, pg. 7, lns. 24-30). The system also includes is a first channel endpoint established at the first node, the first channel endpoint being operative to communicate messages to a second channel endpoint residing at a second node. (*See e.g.*, pg. 8, lns. 22-26). Each of the virtual component and the first channel endpoint is associated with a respective domain through a privileged operation at the first node. (*See e.g.*, pg. 8, ln. 29 to pg. 9, ln. 3). Communication of messages between the virtual component and the first channel endpoint is controlled based on validation of the respective domains for the virtual component and the first channel endpoint. (*See e.g.*, pg. 9, lns. 4-12).

Independent Claim 22:

Independent claim 22 relates to a system to facilitate communication of data. The system includes storage means for receiving a message provided directly from a user-level process. (*See e.g.*, pg. 5, lns. 28-30). Also included is a communication means associated with the storage means. (*See e.g.*, pg. 6, lns. 4-6). Upon validation of a domain association between the storage means and the communication means the communication means sends the stored request to a corresponding communication means at another node in the system. (*See e.g.*, pg. 7, lns. 1-5). The system further includes a validation means for validating the association between the storage means and the communication means. (*See e.g.*, pg. 7, lns. 13-15 and 17-21). The storage means and the communication means is associated in a privileged operation not adjustable by user-level processes. (*See e.g.*, pg. 7, lns. 4-5).

Independent Claim 23:

Independent claim 23 relates to a system to facilitate communication of data. The system includes a virtual storage means at a first node for storing a message for direct communication relative to a user-level process. (*See e.g.*, pg. 7, lns. 24-30). The system also includes an endpoint communication means at the first node for means for, upon determining a common domain membership for the storage means and the endpoint communication means, enabling communication between the virtual storage means and the endpoint communication means. (*See*

3

e.g., pg. 8, lns. 22-26). A control means for independently controlling domain membership for each of the virtual storage means and the endpoint communication means is included in the system. (*See e.g.*, pgs. 8, ln. 29 to pg. 9, ln. 12).

Independent Claim 26:

Independent claim 26 relates to a computer-readable medium having computer-executable instructions. In a privileged mode, the computer-readable medium sets domain membership for a queue of a first node and domain membership for a communication component of the first node. (*See e.g.*, pg. 7, lns. 1-5). The communication component of the first node is operable to communicate messages with a corresponding communication component at a second node. (*See e.g.*, pg. 8, lns. 22-26). The domain membership is inaccessible by user-level processes. (*See e.g.*, pg. 7, lns. 4-5). The queue is mapped into memory of an associated user-level process at the first node, such that the user-level process can communicate directly with the queue. (*See e.g.*, pg. 13, lns. 9-15). The computer-readable medium further controls communication of message between the queue and the communication component based on the domain membership set for each of the queue and the communication component. (*See e.g.*, pg. 13, lns. 16-18).

Independent Claim 29:

Independent claim 29 relates to a method to facilitate communication in a system architecture in which a process is operative to communicate a message directly with a storage component coupled to at least one local communications component in a node for communicating the message for receipt by a second communications component. The method includes associating the storage component with a domain for temporarily storing the message and associating the local communications component with a domain. (*See e.g.*, pg. 21. ln. 28 to pg. 22, ln 3). Also included is controlling communication of a message between the storage component and the local communications component based on the domain of the storage component and the domain of the local communications component. (*See e.g.*, pg. 22, lns. 16-17).

4

VI.   Grounds of Rejection to be Reviewed (37 C.F.R. §41.37(c)(1)(vi))

A.   Whether claims 1-35 are unpatentable under 35 U.S.C. §102(e) over Bruno, *et al.* (U.S. Patent No. 6,604,123).

VII.   Argument (37 C.F.R. §41.37(c)(1)(vii))

A.   <u>Rejection of Claims 1-35 Under 35 U.S.C. §102(e)</u>

Claims 1-35 stand rejected as anticipated by 35 U.S.C. §102(e) over Bruno, *et al.* (U.S. Patent No. 6,604,123). This rejection should be withdrawn for the following reasons. Bruno *et al.* does not teach or suggest all limitations recited in the subject claims.

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989).

<u>Independent claim 1:</u>

Independent claim 1 (and its corresponding dependent claims) recites *a system to facilitate substantially secure communication of data from a user-level process ... wherein communication between a first queue and a first communication context is controlled based on whether an appropriate association exists between the first queue and the first communication context, the association between the first queue and the first communication context being provided through a privileged operation not adjustable by the user-level process.* The association determines which queue may utilize which communication context and without a proper association, communication between the queue and communication context is prevented. The association isolates communication channels in different domains, for example, thereby enhancing integrity of the communication. Bruno, et al. does not expressly or inherently describe such novel features.

5

Bruno, *et al.* discloses transfer of control between computer system protection domains. A server, located in a user-level, registers with the system thereby allowing client application to use the server. Registering the server is performed in the user-level by user-level processes, namely, server, portal manager, client application, and name server. The portal manager associates an identifier "I" with a portal specification and returns the identifier to the server and a specific portal defining the transfer of control is established by the user-level processes. If access to the server is approved, name server returns server identification "I" to the client application. The portal manger creates portal code in the nucleus (privileged operation) by finding an available location (e) in a portal table associated with the client application and inserting a pointer to the portal code at location (e) and returns (e) to the client application.

Thus, Bruno, *et al.* clearly discloses associating a first queue and a first communication context are adjusted by *user-level* processes. The look up is performed in the nucleus but such look up *is* adjustable by the user-level processes. Therefore, Bruno does not teach or suggest all claim limitations.

Independent claim 14:

Independent claim 14 (and its corresponding dependent claims) recites *a system to facilitate communication of data comprising a virtual hardware component ... and a first channel endpoint ... associated with a respective domain through a privileged operation.* The association with a domain determines if the virtual component and first channel endpoint can communicate with each other, and, if there is not a proper association, communication is prevented. Bruno, merely discloses associating a first queue and a first communication context through *user-level* processes. Specifically, the association is performed by a server, portal manager, client application, and name server, all in the user-level. Therefore, Bruno does not teach or suggest all claim limitations.

Independent claim 22:

Independent claim 22 recites *a system to facilitate communication of data comprising ... a storage means and a communication means associated in a privileged operation not adjustable by user-level processes.* The storage means and communication means are associated to either allow or prohibit communication. Bruno does not disclose such features but rather

6

discusses control transfer between computer system protection domains. The association of Bruno *et al.* is performed by user-level processes, and is thus adjustable by such user-level processes. Bruno *et al.* is silent regarding an association in a privileged operation that is not adjustable by user-level processes because Bruno *et al.* relies upon the user-level processes to perform the association.

Independent claim 23:

Independent claim 23 (and its corresponding dependent claims) recites *a system to facilitate communication of data comprising a virtual storage means and endpoint communication means ... and control means for independently controlling domain membership for each of the virtual storage means and the endpoint communications means.* Such control means includes a *privileged operation* as disclosed in Applicant's specification. Bruno *et al.* does not teach or suggest such features and merely discloses user-level processes that associate a first queue and a first communication context.

Independent claim 26:

Independent claim 26 (and its corresponding dependent claims) recites *a computer-readable medium having computer-executable instruction for in a privileged mode, setting domain membership for a queue of a first node and setting domain membership for a communication component of the first node...* The domain membership allows communication between a queue and a communication component that belong to the same domain membership. Bruno clearly does not disclose a privileged mode process setting a domain membership but rather discloses the membership being performed by user-level processes, namely server, portal manager, client application, and name server.

Independent claim 29:

Independent claim 29 (and its corresponding dependent claims) recites *a method to facilitate communication in a system architecture ... comprising ... associating a storage component with a domain ... associating a local communications component with a domain, and controlling communication of a message between the storage component and the local communications component based on the domain of the storage component and the domain of*

7

the local communications component. Associating a storage component with a domain is performed by a privileged operation as discussed in applicant's specification. Bruno *et al.*, on the other hand, discloses an association performed by user-level processes. While a look up is performed in a privileged level, the association is performed by the user-level processes.

B.   Conclusion

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejection of claims 1-35 be reversed.

If any additional fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP186US].

Respectfully submitted,
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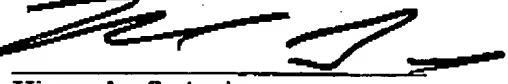
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8

VIII. Claims Appendix (37 C.F.R. §41.37(c)(1)(viii))

1.   A system to facilitate substantially secure communication of data from a user-level process, comprising:

   at least a first queue associated with the process, such that the process is operative to directly communicate a message relative to the first queue; and

   a first communication context operative to communicate the message between the first queue and a second communication context;

   wherein communication between the first queue and the first communications context is controlled based on whether an appropriate association exists between the first queue and the first communications context, the association between the first queue and the first communications context being provided through a privileged operation not adjustable by the user-level process.

2.   The system of claim 1, wherein the first queue and the first communication context reside at a first node that is different from that of the second communication context.

3.   The system of claim 2, further comprising an interface at the first node operative to validate messages communicated from the first queue to the first communication context.

4.   The system of claim 3, wherein the interface is operative to prevent messages from being communicated from the first queue to the first communication context if an association mismatch exists between the first queue and the first communication context.

5.   The system of claim 2, wherein the appropriate association between the first queue and the first communication context requires membership to a common domain.

6.   The system of claim 5, further comprising a second queue associated with a second process at the first node, such that the second process is operative to directly communicate a message to the second queue.

9

7.   The system of claim 6, wherein the second queue is associated with the common domain through a privileged operation, such that the first and second queues can share the first communication context to communicate messages through a channel defined by the first communication context and the second communication context, each of the first and second queues being operative to communicate messages with at least one process at a node where the second communication context resides.

8.   The system of claim 7, wherein the first process further comprises a process operating in a user mode and the second process comprises a process operating in a user mode.

9.   The system of claim 6, further including a third communication context associated with the second queue through a privileged operation at the first node, the third communication context enabling communication between the third communication context and a fourth communication context that resides a node different from the first node.

10.   The system of claim 9, wherein the common domain is a first domain, the association between the second queue and the third communication context corresponding to a second domain that is different from the first domain, wherein each communication channel established in the second domain is isolated from each channel established in the first domain.

11.   The system of claim 1, wherein the first queue and the first communication context reside at a first node that is different from a second node at which the second communication context resides, the system further comprising a third communication context at the first node to enable communication of messages between the third communication context and a fourth communication context that resides at a third node that is different from the first node.

12.   The system of claim 11, wherein the first queue is associated with the third communication context through a privileged operation, such that the first process is operative to communicate the message over a communication channel established between the third communication context and a fourth communication context that resides at the third node, which is different from the second node.

10

13.   The system of claim 11, wherein the first queue and the first communication context are associated so as to be part of a first domain, the system further comprising a second queue is associated with a second process, the second queue being associated with a third communication context so as to be part of second domain that is isolated relative to the first domain.

14.   A system to facilitate communication of data, comprising:

a virtual hardware component at a first node operable to communicate a message received directly from an associated process; and

a first channel endpoint established at the first node, the first channel endpoint being operative to communicate messages to a second channel endpoint residing at a second node;

wherein each of the virtual component and the first channel endpoint is associated with a respective domain through a privileged operation at the first node, communication of messages between the virtual component and the first channel endpoint being controlled based on validation of the respective domains for the virtual component and the first channel endpoint.

15.   The system of claim 14, wherein hardware at the first node is operative to prevent messages from being sent between the virtual component and the first channel endpoint in response to detecting an invalid association between the virtual component and the first channel endpoint.

16.   The system of claim 14, wherein the virtual component is a first virtual component, the system further comprising a second virtual hardware component operative to communicate a message directly with an associated process at the first node.

17.   The system of claim 16, wherein the second virtual hardware component and the first virtual hardware component are members of a common domain, domain membership being assigned through a privileged operation not adjustable by the first or second process, wherein the first and second virtual components are operative to share the first channel endpoint of the first node, such that each of the first and second processes can communicate messages with at least one process at the second node.

11

18.   The system of claim 14, further including a third channel endpoint at the first node, the third channel endpoint being operative to communicate messages with a fourth channel endpoint that resides at a node different from the first node.

19.   The system of claim 18, wherein the virtual component is a first virtual hardware component, the system further comprising a second virtual hardware component at the first node that is associated with the third channel endpoint through a privileged operation at the first node.

20.   The system of claim 19, wherein each of the first and third channel endpoints belongs to different domains, such that each communication channel established between associated channel endpoints in one of the domains is isolated from each communication channel established between associated channel endpoints in each other of the domains.

21.   The system of claim 19, wherein each of the first and third channel endpoints belongs to a common domain, such that each of the first and second processes at the first node is operative to share first and third channel endpoints to respectively communicate a message with at least one process at the second and third nodes based on data in the respective message.

22.   A system to facilitate communication of data, comprising:
        storage means for receiving a message provided directly from a user-level process;
        communication means associated with the storage means for, upon validation of a domain association between the storage means and the communication means, sending the stored request to a corresponding communication means at another node in the system; and
        validation means for validating the association between the storage means and the communication means, the storage means and the communication means being associated in a privileged operation not adjustable by user-level processes.

12

23.   A system to facilitate communication of data, comprising:

virtual storage means at a first node for storing a message for direct communication relative to a user-level process;

endpoint communication means at the first node for means for, upon determining a common domain membership for the storage means and the endpoint communication means, enabling communication between the virtual storage means and the endpoint communication means; and

control means for independently controlling domain membership for each of the virtual storage means and the endpoint communication means.

24.   The system of claim 23, wherein the endpoint communication means further includes means for preventing communication of messages between the virtual storage means and the endpoint communication means in the absence of a common domain membership among virtual storage means and the endpoint communication means.

25.   The system of claim 23, wherein the endpoint communication means further includes means for permitting communication of messages between the virtual storage means and the endpoint communication means when common domain membership exists among virtual storage means and the endpoint communication means.

26.   A computer-readable medium having computer-executable instructions for:

in a privileged mode, setting domain membership for a queue of a first node and setting domain membership for a communication component of the first node, the communication component of the first node being operable to communicate messages with a corresponding communication component at a second node, the domain membership being inaccessible by user-level processes, the queue being mapped into memory of an associated user-level process at the first node, such that the user-level process can communicate directly with the queue; and

controlling communication of message between the queue and the communication component based on the domain membership set for each of the queue and the communication component.

13

27.   The computer-readable medium of claim 26 having further computer-executable instructions for providing an error message to the associated user-level process if the domain membership between the queue and the communication component is invalid.

28.   The computer-readable medium of claim 26 having further computer-executable instructions for analyzing the message to identify which of a plurality of communication contexts is designated and validating domain membership between the queue and the designated communication context to control communication of the message between the queue and the designated communication context.

29.   A method to facilitate communication in a system architecture in which a process is operative to communicate a message directly with a storage component coupled to at least one local communications component in a node for communicating the message for receipt by a second communications component, the method comprising:
        associating the storage component with a domain for temporarily storing the message;
        associating the local communications component with a domain; and
        controlling communication of a message between the storage component and the local communications component based on the domain of the storage component and the domain of the local communications component.

30.   The method of claim 29, wherein the domain for the storage component and the domain for the association of the local communications component are implemented independently in privileged operation not adjustable by the user-level process.

31.   The method of claim 30, wherein the controlling further comprises validating the domain of the storage component relative the domain of the local communication component.

32.   The method of claim 31, further comprising preventing communication of the message from the storage component to the communication component in the absence of a match between the domain of the storage component and the domain of the communication component.

14

33.   The method of claim 32, further comprising generating an error message in the absence of a match between the domain of the at least part of the storage component and the domain of the communication component.

34.   The method of claim 32, further comprising sending the message from the storage component to the communication component in response to a valid association existing between the domain of the storage component and the domain of the communication component.

35.   The method of claim 30, further comprising discerning from the message which of at least one of a plurality of communication components is designated and validating association between the storage component and each designated communication component to control communication of the message between the storage component and each designated communication component.

15

IX.   Evidence Appendix (37 C.F.R. §41.37(c)(1)(ix))

None.

X.   Related Proceedings Appendix (37 C.F.R. §41.37(c)(1)(x))

None.